

CLAIMS :

1. An electric motor comprising:
 - a rotor; and
 - a stator;
 - wherein the rotor is supported on a substantially spherical bearing and is of a substantially spherical design facing the stator;
 - wherein the stator has a magnetic return-path body made of a compressed powder material; and
 - wherein at least segments of the return-path body facing the rotor are of a substantially spherical design facing the rotor.
2. The electric motor according to claim 1, wherein:
 - the return-path body is a compact body or comprises compact return-path body elements.
3. The electric motor according to claim 1, wherein:
 - the return-path body is composed of a plurality of return-path body elements.
4. The electric motor according to claim 3, wherein:
 - adjacent return-path body elements are connected via a plug connection.
5. The electric motor according to claim 1, wherein:
 - the return-path body comprises a plurality of segments each having a substantially spherical surface facing the stator.
6. The electric motor according to claim 5, wherein:
 - adjacent segments are magnetically separated.

7. The electric motor according to claim 5, wherein:
a gap is provided between adjacent segments.
8. The electric motor according to claim 5, wherein:
segments are connected to one another via a return-path area.
9. The electric motor according to claim 1, wherein:
the return-path body surrounds the rotor in a ring shape.
10. The electric motor according to claim 1, wherein:
the powder material comprises iron granules electrically insulated relative to one another.
11. The electric motor according to claim 1, wherein:
the return-path body has at least one coil receiving portion.
12. The electric motor according to claim 11, wherein:
the coil receiving portion is provided with an electric insulation and/or an accommodated coil is provided with an electric insulation towards the coil receiving portion.
13. The electric motor according to claim 11, wherein:
the at least one coil receiving portion is arranged and designed such that accommodated coils do not project beyond a spherical area of the return-path body in the direction of the rotor.
14. The electric motor according to claim 11, wherein:
an air gap formed between the rotor and a spherical area of the return-path body is free from coils.

15. The electric motor according to claim 11, wherein:
the return-path body has a plurality of recesses as coil receiving portions or for the formation of coil receiving portions.
16. The electric motor according to claim 15, wherein:
a recess having an area facing the rotor is set back in relation to the spherical surface of the return-path body.
17. The electric motor according to claim 11, wherein:
a coil is wound onto a coil receiving portion.
18. The electric motor according to claim 11, wherein:
a prefabricated coil is positioned on a coil receiving portion.
19. The electric motor according to claim 10, wherein:
a coil receiving portion is dimensioned such that the part of the return-path body located in the area of the generated magnetic field of the accommodated coil is considerably smaller than the area of the return-path body transferring the generated magnetic field towards the rotor.
20. The electric motor according to claim 10, wherein:
a coil receiving portion is dimensioned such that an adequate area of the return-path body is made available in order to transport magnetic flux below the saturation level.
21. The electric motor according to claim 10, wherein:
a coil receiving portion is designed such that a coil with a round or approximately round cross section is adapted to be accommodated.

22. The electric motor according to claim 10, wherein:
the return-path body has a plurality of adjacent recesses as coil receiving portions, said recesses being set back in relation to the spherical surface.
23. The electric motor according to claim 22, wherein:
the recesses are arranged so as to be distributed uniformly around an inner circumference of the return-path body.
24. The electric motor according to claim 22, wherein:
a coil axis of a coil seated in the coil receiving portion lies substantially in circumferential direction of the return-path body.
25. The electric motor according to claim 22, wherein:
a coil axis of a coil seated in the coil receiving portion is aligned substantially radially.
26. The electric motor according to claim 10, wherein:
the at least one coil receiving portion is arranged behind or beneath the spherical surface area of the return-path body facing the rotor.
27. The electric motor according to claim 26, wherein:
the return-path body has a connecting area located transversely to an axis of rotation of the rotor and making a transverse magnetic connection available.
28. The electric motor according to claim 27, wherein:
the at least one coil receiving portion is formed at the connecting area.
29. The electric motor according to claim 1, wherein:

the rotor is a cage rotor.

30. The electric motor according to claim 1, wherein:
the rotor is adapted to generate a magnetic field.
31. The electric motor according to claim 30, wherein:
the rotor comprises a plurality of permanent magnets.
32. The electric motor according to claim 1, wherein:
the rotor is a hysteresis rotor.
33. The electric motor according to claim 1, wherein:
a plurality of coils are arranged on the return-path body as torus-shaped windings.
34. The electric motor according to claim 33, wherein:
a winding axis is substantially parallel to a circumferential direction of the return-path body.
35. The electric motor according to claim 33, wherein:
the return-path body is formed in one piece.
36. The electric motor as defined in claim 33, wherein:
adjacent coils are electrically connected separately.
37. A circulation pump comprising:
an electric motor, comprising:
a rotor; and
a stator;

wherein the rotor is supported on a spherical bearing and is of a spherical design facing the stator;

wherein the stator has a magnetic return-path body made of a compressed powder material; and

wherein the return-path body is of a spherical design facing the rotor, at least in segments facing the rotor.

38. Circulation pump according to claim 37, wherein:
 - a partition wall is arranged in an air gap between rotor and return-path body.
39. Circulation pump according to claim 38, wherein:
 - the air gap is dimensioned such that the rotor is not essentially braked by friction in the area between partition wall and rotor.